The Future Mix of U.S. ISR Forces

I n recent conflicts, the U.S. Air Force has consistently demonstrated its ability to destroy almost any target effectively and efficiently with precision-guided conventional weapons. One avenue of improvement in the Air Force's operational effectiveness may lie in its ability to find, precisely locate, and identify some kinds of critical targets (e.g., mobile missiles and enemy leadership), particularly in a hostile environment. The Air Force currently relies on a fleet of manned aircraft, supplemented by national intelligence collection satellites and (recently) by a limited number of unmanned air vehicles (UAVs), to provide the intelligence, surveillance, and reconnaissance (ISR) support that it needs.

While these systems provide considerable capability, they also have limitations. Current sensors are not always adequate against difficult targets. Existing platforms may not be able to provide the necessary ISR coverage of all geographic areas of interest, particularly in areas of high threat. Better sensors and processors are becoming available that could improve the capability to detect, identify, and track some kinds of difficult targets. New platforms, such as different kinds of UAVs and satellites, may offer performance advantages and, in some cases, cost savings over current ISR systems. The Air Force asked RAND Project AIR FORCE to identify the most cost-effective force mix options for meeting the United States' future ISR requirements.

- **A force of large, stealthy UAVs would be cheaper and more effective than maintaining the current ISR force.** These UAVs would be larger than current UAVs in order to accommodate a larger payload of advanced sensors and still provide continuous coverage of large areas. Unlike manned aircraft and current UAVs, stealthy UAVs may be able to provide continuous coverage of all major areas of interest in a campaign. The UAV force itself would be 40 percent cheaper than maintaining the current fleet. However, these savings may be offset by the cost of developing new technology and the need to retain current forces for a longer period of time.
- **In principle, the same performance could be achieved with new radar satellites (supplemented by other systems), but at a much higher cost and at greater technical risk.** A very large constellation of very large, technically advanced satellites proved to be the most cost-effective space-based option. However, even this option would be much more expensive than the stealthy UAV force and would involve more advanced technology than has been considered so far for space systems.
- **A mixed force of stealthy UAVs and a few satellites would cost about the same as maintaining the current force and would be much more effective.** A mixed force, comprised of a few small satellites with moving target indicator and synthetic aperture radar systems and a large force of stealthy UAVs with full sensor suites, could be equally effective as either "pure" force, but only with the proper division of labor. The UAVs would have to bear the burden of tracking individual moving targets such as mobile missiles. The satellites could provide enough imaging capability to handle all of the stationary targets in a moderate-sized theater and to track large groups of moving vehicles.
- **All of the options would benefit from further improvement.** In particular, any future ISR system will depend on dramatic improvements in information processing to be fully effective. Moreover, some problems, such as the classification and identification of individuals, may prove to be too difficult or costly. ■